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IRN: Tissue Engineering of the Peripheral Nerve – Stem Cells and Regeneration Promoting Factors

PREFACE

Consensus exists among both basic and clinical scientists that peripheral nerve repair is no longer a matter of surgical reconstruction only, but rather a matter of tissue engineering which brings together several interdisciplinary and integrated treatment strategies.

In 2009, we edited a first thematic issue of the *International Review of Neurobiology* entitled "Essays on Peripheral Nerve Repair and Regeneration" (Volume 87) that collected a number of reviews on various and broad aspects of peripheral nerve regeneration research (including also several methodological papers). Following the interest raised by that book, and considering the growing scientific interest on nerve repair and regeneration, we have edited this new thematic issue of the *International Review of Neurobiology* which is intended to address more specifically some of today's hot topics on peripheral nerve's tissue engineering, namely stem cells and regeneration promoting factors.

Tissue engineering is an emerging science that finds it roots in various and complimentary disciplines (from molecular biology and biomaterials to transplantation and reconstructive microsurgery) and, in order to reflect its interdisciplinary and multi-translational spirit, this thematic issue of the *International Review of Neurobiology* brings together ten reviews which aim to cover some of the most promising innovative strategies for promoting peripheral nerve repair and regeneration, that emerge from basic research in the different relevant scientific areas.

After a couple of introductory reviews that set up the stage, three papers address the issue of cell transplantation for nerve reconstruction, with special emphasis on the potential use of stem cells from mesenchymal origin.

The book continues with four reviews that address the perspectives of growth factor-mediated therapies for improving peripheral nerve repair, and is concluded by two other papers on the role of the local environment (extracellular matrix) in nerve regeneration.

Although the papers included in this book address topics that are more specific in comparison to those addressed in the *International Review of Neurobiology* thematic issue published in 2009, all reviews have been written avoiding excessive technical details and in order to be accessible to a broad and interdisciplinary audience. It is thus expected that this collection of papers will stimulate the interest of many interdisciplinary researchers (both with basic and clinical background) and will eventually contribute to the scientific progress in tissue engineering of the peripheral nerve as well as to its successful future applications with patients suffering from nerve injury.